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FORM 1449*	INFORMATION DISCLOSURE STATES	ENTJAN 3 1 2002	3C97	Docket Number: 510015-265	Application Number: 09/935,012	
	IN AN APPLICATION	图		Applicant: Larry A. Coldren et al	l.	
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			U.S. PATENT DOCUMENT	S		
EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
Dron	5,045,499	09/03/91	H. Nishizawa et al.			./
	5,082,799	01/21/92	R.P. Holmstrom et al.			<del>/</del>
	5,251,225	10/05/93	S.J. Eglash et al.	1		<del></del>
	5,293,392	03/08/94	CL. Shieh et al.			
<del>                                     </del>	5,343,487	08/30/94	J.W. Scott et al.			
non	5,358.880	10/25/94	M.S. Lebby et al.			
					**************************************	FECHNOLIS ATION OF PESS OF INC.
		F	OREIGN PATENT DOCUME	NTS		78 m 70
	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION
	International Publication	19 Feb. 1998	PCT (V. Jayaraman)		-	YES J ING
	No. WO 98/07218					NE CEF
MA	JP 57026492 A	12 Feb. 1982	Japan (Y. Kameshima)	·	1 1	CEHIER
						28
	O	THER DOCUME	NTS (Including Author, Title, Da	te, Pertinent Pages,	Etc.)	2800
	K.A. Black	et al., "Double-fuse	ed 1.5 µm vertical cavity lasers w	vith record high To o	f 132K at room temper	ature" Electronics Letters,
nou	Vol. 34, pp	. 1947-1949 (1998)	1			
	V. Jayarama	n et al., "Uniform	threshold current, continuous-wa	ve, singlemode 1300	Inm vertical cavity lase	ers from 0 to 70°C,"
			р. 1405-1407 (1998)			
	M. Ortsiefer	et al, "Submilliam	p long-wavelength InP-based ve	rtical-cavity surface	emitting laser with sta	ble linear polarization,"
	Electronics	Letters, Vol. 36, p	p. 1124-1126 (2000)			
	W. Yuen et	al., "High-perform	ance l.6µm single-epitaxy top-en	nitting VCSEL," Ele	ctronics Letters, Vol. 3	6, pp. 1121-1123 (2000)
	O. Blum et a	al., "Electrical and	optical characteristics of AlAsSb	/GaAsSb distributed	Bragg reflectors for su	rface emitting lasers," Appl
1	Phys. Lett.,	Vol. 67, pp. 3233-	3235 (1995)			
	O. Blum et a	al, "Highly reflective	ve, long wavelength AlAsSb/Ga/	AsSb distributed Bra	gg reflector grown by r	nolecular beam epitaxy on
}	InP substrat	es," Appl. Phys. Le	tt., Vol. 66, pp. 329-331 (1995)			•
-	J. Boucart e	t al., "1-mW CW-R	T Monolithic VCSEL at 1.55 μπ	n," IEEE Photonics	Technology Letters, Vo	ol. 11, pp. 629-631 (1999)
	. T. Uchida e	al, "CBE Grown 1	.5 μm GalnAsP-InP Surface Em	itting Lasers," <i>IEEE</i>	Journal of Quantum E	Electronics, Vol. 29, pp.
Win	1975-1980 (	1993)			•	

EXAMINER Delma R. Flores Ruz	DATE CONSIDERED	11/	· ·
EXAMINER: Initial if reference considered, whether or not citation is in conform considered. Include copy of this form for next communication to the Applicant.		e throu	ugh citation if not in conformance and not

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INFORMATION DISCLOSURE STATEMENT	Docket Number: 510015-265	Application Number: 09/935,012
IN AN APPLICATION AND 3 1 2002	Applicant: Larry A. Coldren et al	
(Use several sheets if necessary)	Filing Date: August 21, 2001	Group Art Unit: 2881

			U.S. PATENT DOCUMENT	S	<del></del>		
EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS		DATE OPRIATE
DUFA	5,392,307	02/21/95	Y. Sugiyama et al.			·	
	5,416,044	05/16/95	T. Chino et al.				/
	5,468,343	11/21/95	T. Kitano				
	5,568,504	10/22/96	A. Köck et al.				
<del></del>	5,588,995	12/31/96	P. Sheldon			-	<del></del>
	5,631,472	05/20/97	J.E. Cunningham et al.				
DIFFIL	5,877,038	03/02/99	L.A. Coldren et al.		-		
200	<u> </u>	]	FOREIGN PATENT DOCUME	NTS,			
	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANS	LATION
						YES	NO
	-						
	<u> </u>	THER DOCUME	NTS (Including Author, Title, Da	ate, Pertinent Pages,	Etc.)		L
	M.G. Pete	rs et al "Band-gap	engineered digital alloy interfaces	for lower resistance	e vertical-cavity surfac	e-emitting laser	s," Appl. Phys.
DIFR	1 1	63, pp. 3411-3413			of the state of th	<b>-</b>	
<del>/</del>	E. Hall et	al., "Electrically-pu	mped, single-epitaxial VCSELs at	1.55 μm with Sb-b	ased mirrors," Electro	nic <b>s</b> betters, Vo	l. 35, pp. 1-2,
	(1999)					i i	רנ־
	l i	•	ed electrical and thermal propertie mology Letters, Vol.12, pp. 1322-1	•	Bragg mirrors for long	-vævelengti ve	rtical-cavity
	E. Hall et	al, "Selectively Etcl	ned Undercut Apertures in AIAsS	b-Based VCSELs,"	submitted to IEEE Pho	otenics Technolo	ogy tetters.
	Vol. 13, p	p. 97-99 (2001)				200 NTE	Ē.
	i I		ar beam epitaxial growth of mono rrors," Journal of Vacuum Science	·		્રાઇ	·
	J.W. Scot	et al, "High Efficie	ncy Submilliamp Vertical Cavity	Lasers with Intracay	vity Contacts," IEEE F	Photonics Techno	ology Letters,
	Vol. 6, pp	o. 678-680 (1994)					
	1	ne, and L.A. Coldrei pp. 1339-1341 (1999	n, "Tapered Air Apertures for The	rmally Robust VCL	Structures," IEEE Pho	otonics Technol	ogy Letters,
DRFA	1	et al, "Epitaxially-st op. 3251-3253 (1999	acked multiple-active-region 1.55	μm lasers for increa	ased differential efficion	ency," Applied F	Physics Letters,

EXAMINER Delma	a R. Flores K	DATE CONSIDERED	11/05
	e considered, whether or not citation is form for next communication to t		w line through citation if not in conformance and not

FORM 1449\*

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EXAMINER	DOCUMI	ENT NO	DATE	NAME	IENTS	T CLASS	CURC	CLASS	FILIN	G DATE
INITIAL		ENT NO.				CLASS	3050	LASS		OPRIATE
Drien	5,974,073		10/26/99	P.J. Cannard et al.						
	6,021,147		02/01/00	W. Jiang et al.						
	6,057,560		05/02/00	M. Uchida						,
	6,061,380		05/09/00	W. Jiang et al.						
	6,127,200		10/03/00	Y. Ohiso et al.						
David	6,207,973 B1		03/27/01	S. Sato et al.						
			F	OREIGN PATENT DOC	UMENT	\$	•			
	DOCUME	ENT NO.	DATE	COUNTRY		CLASS	SUBC	LASS	TRANS	LATION
									YES	NO ·
	. <u></u>	OT	HER DOCUME	NTS (Including Author, Tit	le, Date,	Pertinent Pages,	Etc.)			<u>,ı</u>
DIFIL		-	l., "Minimum tem 1814-1816 (1998)	perature sensitivity of 1.55	μm vert	ical-cavity lasers	at —30 nm	gain offse	t," Applied Phys	sics Letters,
<del>                                     </del>		E. Hall et al.,	, "Increased Latera	al Oxidation Rates of AllnA	s on InP	using Short-Per	iod Superla	ttices," Elec	ctronic Material	ls Conference,
		Journ. Electr	on. Materials, Vo	l. 29, No. 9, pp. 1100-1104	(2000)					
		E.R. Hegblor (1998)	m et al., "Small efi	ficient vertical cavity lasers	with tap	ered oxide apert	ures," <i>Elect</i>	ronics Lette	ers, Vol. 34, pp.	895-896
			u et al., "Accurate wth, Vol. 208, pp.	control of Sb composition i	n AlGaA	AsSb alloys on Ir	P substrate		Lu .	xy," Journal of
<del></del>				rature, electrically-pumped	multiple	-active-region V	CSELs with	high diffe	Tential efficience	v 21 1.55 μm."
		Electronics L	Letters, Vol. 35, pp	o. 1084-5, No. 13, pp. 1-2 (	1999)				100 83.	EC
				mitting devices with distrib I. 127, pp. 1-4, (1993)	outed Bra	igg reflectors gro	wn by high	ly precise r	nolecular beam	epilaly,"
1.		M. Yano, et a	al., "Time-resolved	d reflection high energy ele	ctron dif	fraction analysis	for atomic	layer depos	sitions of GaSb I	by <del>mo</del> ecular
DREN		beam epitaxy	," Journal of Crys	etal Growth, Vol. 146, pp. 3	149-353 (	(1995)		1 1 2 2	R 28	<del></del> -
				···				Y	00	

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EXAMINER Talma R. Flores Rus	DATE CONSIDERED	02
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Examiner Signature

	Complete if Known	
Application Number	09/935,012	
Filing Date	August 21, 2001	
First Named Inventor	Larry A. Coldren et al.	
Art Unit	2881	
Examiner Name	Not assigned	
Attorney Docket Number	510015-265	

-			U.S. PATENT	DOCUMENTS			
Examiner	Cite	Document Number	Publication Date	Name of Patentee or	-1		
Initials*	No. 1	Number -Kind Code <sup>2</sup> (if known)	MM-DD-YYYY	Applicant of Cited Document	93		
DAN		US-4,829,347	05/09/89	Cheng et al.		_	70
		US-5,245,622	09/14/93	Jewell et al.	ارزا	ن	m
7	<u> </u>	US-5,422,901	06/06/95	Lebby et al.	G;	1	
		US-5,693,180	12/02/97	Furukawa et al.	ζ.	<u> </u>	
<del></del>		US-5,719,891	02/17/98	Jewell	:	<u> </u>	17
		US-5,985,683	11/16/99	Jewell	岦	7-3	<u> </u>
NIFA		US-5,991,326	11/23/99	Yuen et al.	2.8		
<u> </u>		US-			00		-

FOREIGN PATENT DOCUMENTS							
Examiner Initials*	Cite No. 1	Foreign Patent Document  Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>	
	1			•		_	

Examiner Initials	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T²
Mex		C. Starck, "Long Wavelength VCSEL with Tunnel Junction and Metamorphic A1As/GaAs Conductive DBR", LEOS '99: IEEE Lasers and Electro-Optics Society 1999 12 <sup>th</sup> Annual Meeting, November 1999, Vol. 1, pp. 139-140, especially Figure 1.	
Den		K.D. Choquette et al., "Room Temperature Continuous Wave InGaAsN Quantum Well Vertical-Cavity Lasers Emitting at 1.3 μm", ELECTRONICS LETTERS, 03 August 2000, Vol. 36 No. 16, pp. 1388-1390.	

Dilma & Flores &

Date Considered

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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